



An overview of Proba-1 CHRIS data acquisition for the scientific community over the mission lifetime

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Proba-1 CHRIS End of Mission Workshop

18-19 January 2024

Ghent Marriott Hotel, Belgium



Remote Sensing Applications Consultants Limited has had the privilege of acting on behalf of ESA throughout the lifetime of the CHRIS mission

- Member of Steering Committee
- Preparing CHRIS Data Announcement of Opportunity
- Compiling Experimenters' Handbook
- Setting up image acquisition planning procedures
- Supporting the growing PI community
- Supporting Experimenters' Meetings, Results Meetings and Workshops



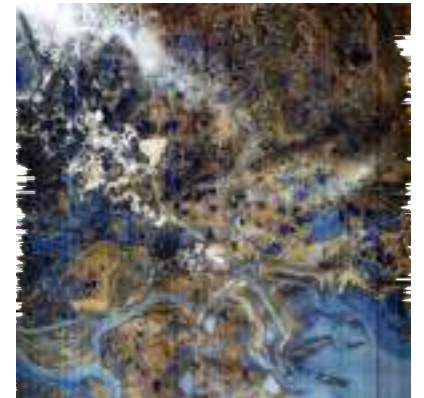
Remote Sensing Applications Consultants Limited has had the privilege of acting on behalf of ESA throughout the lifetime of the CHRIS mission

- Routine acquisition planning operations
 - liaising with science teams to gather their data needs
 - maintaining a record of data requirements in the **CHRIS Nominal Acquisition Plan**
 - selecting sites to be targeted by CHRIS each day as part of the **Active Acquisition Plan**
- Organisation of *ad hoc* image acquisitions

Ad-hoc CHRIS acquisition over Mount Etna eruption, December 2015



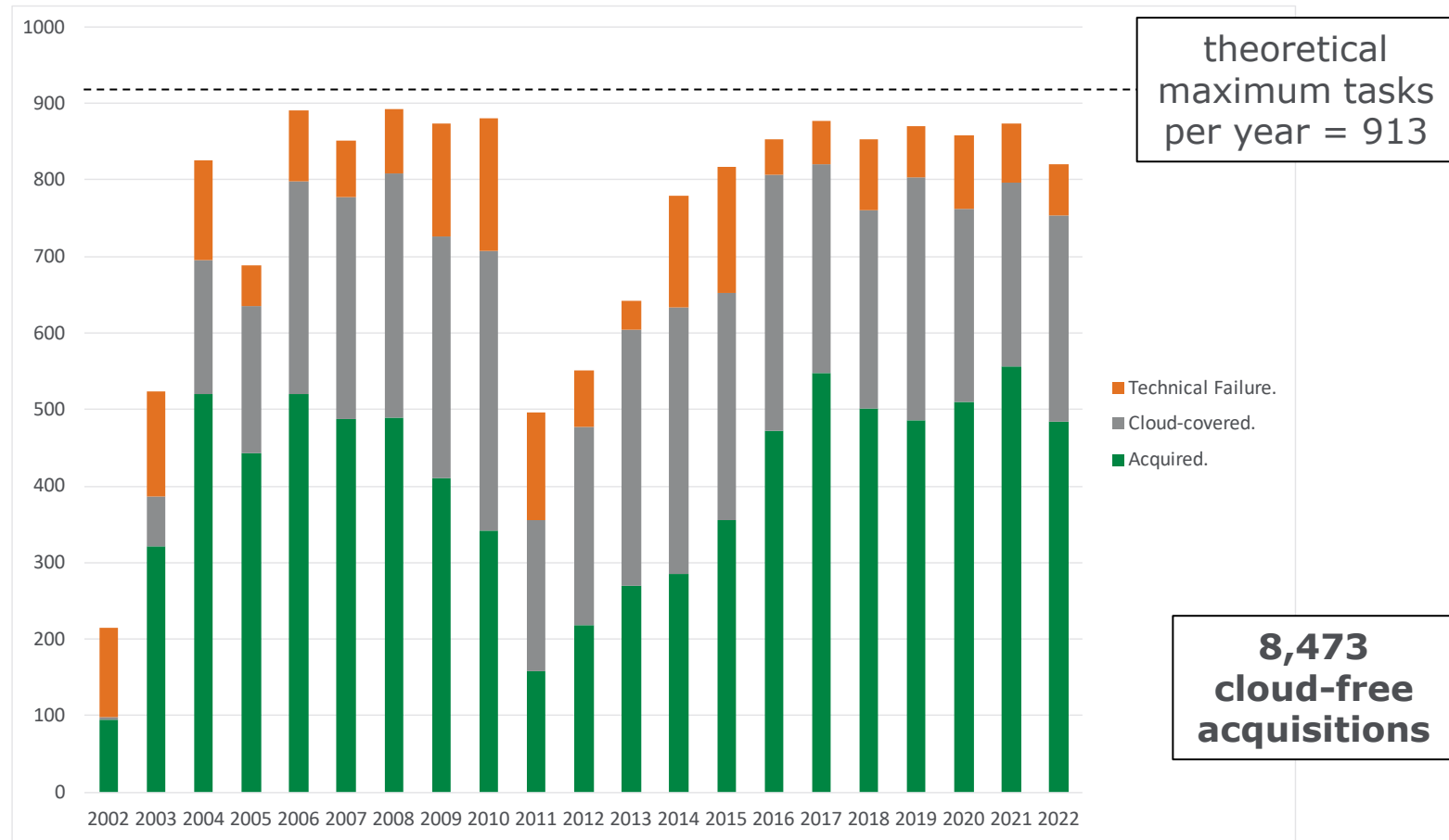
Ad-hoc CHRIS acquisition over oil spill in the Ambarnaya River, Siberia, May 2020



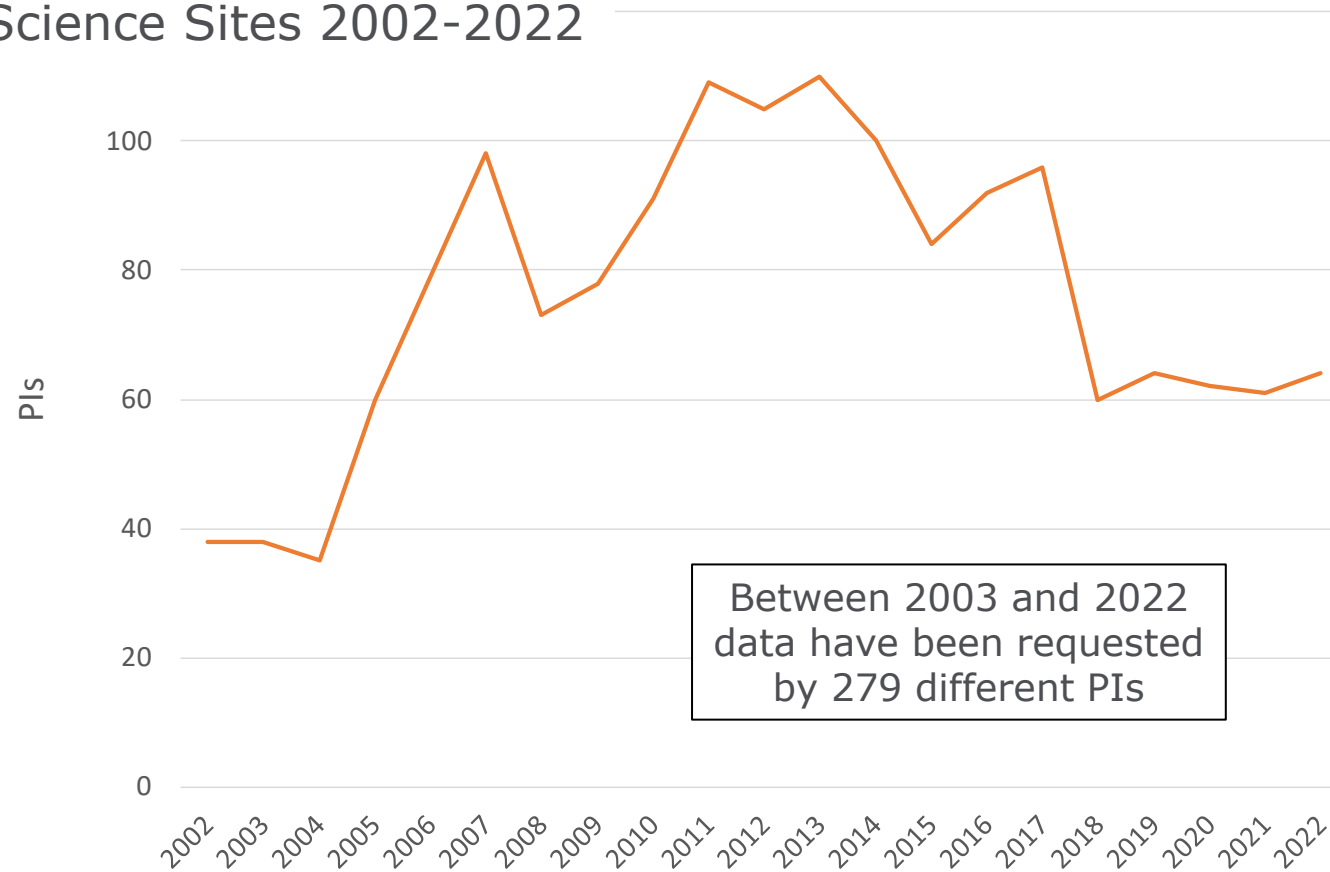
- Proba-1 being a demonstration mission with limited onboard resources, CHRIS data acquisition was restricted to 2-3 targets per day
- Targets carefully selected to ensure science objectives optimally addressed and all users satisfied
- Target selection took into consideration user requirements and a range of other criteria
 - ! urgent requests related to dedicated field campaigns, specific events (e.g. algal blooms)
 - 🌱 seasonal imaging requirements
 - 📄 imaging frequency requirements
 - ☁️ weather forecast
 - ☀️ solar illumination of the target
 - 📐 viewing angle from the satellite
 - 🕒 time between targets
 - 🗄️ available onboard memory between downlink opportunities
 - 👤 fair distribution of imaging attempts
- Too many balances and trade-offs for an automated process!

- Targets selected 2-5 days in advance
- Achieving PI satisfaction and good image acquisition success rates a constant challenge in the face of
 - persistently cloud-covered targets
 - large numbers of clustered targets
 - seasonally unviable targets
 - satellite hiccups
- Target selection process also affected by Proba-1's orbit evolution
 - changing overpass time
 - eventual switch to ascending overpasses
 - periods of inactivity due to solar exposure anomalies

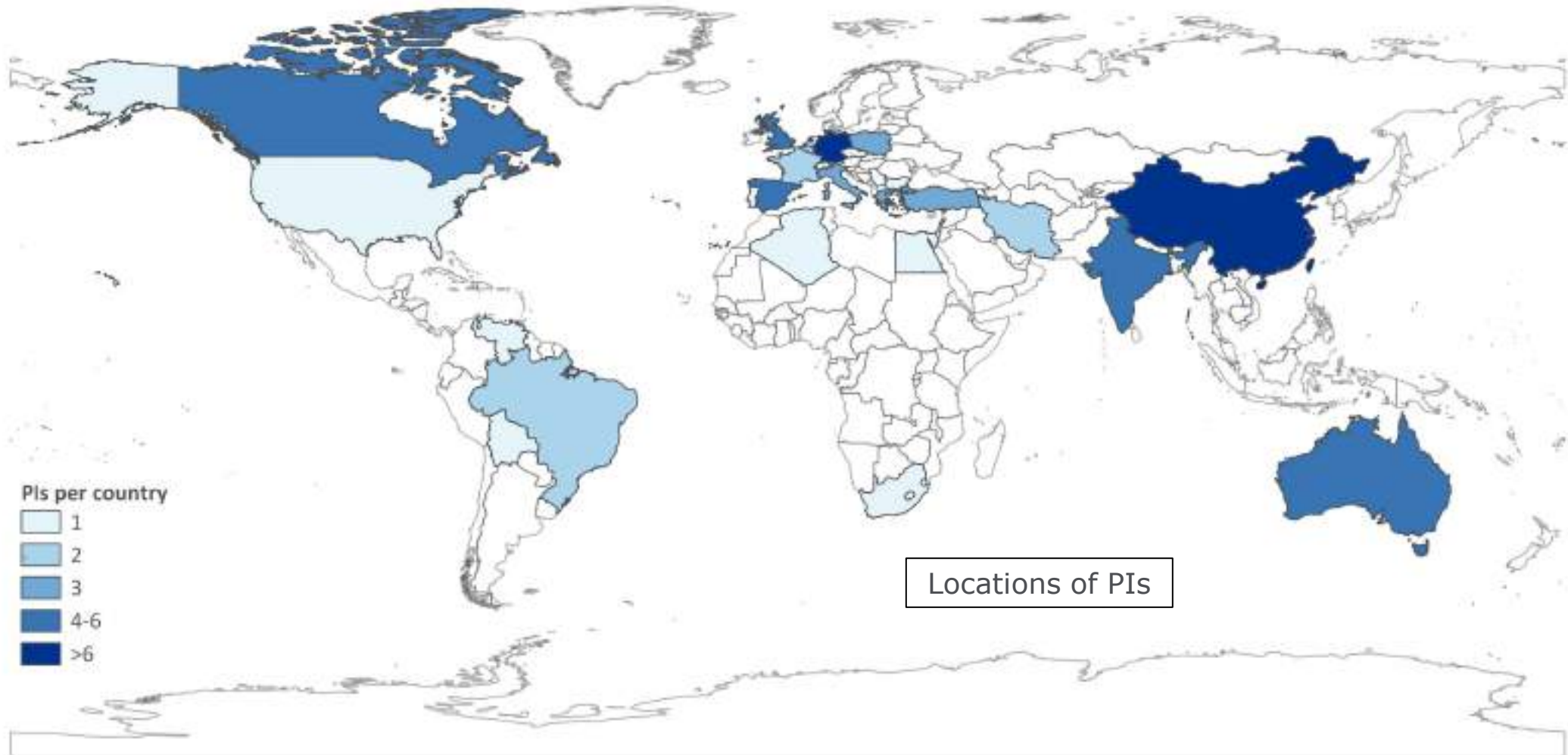
Overall Science Image Acquisitions



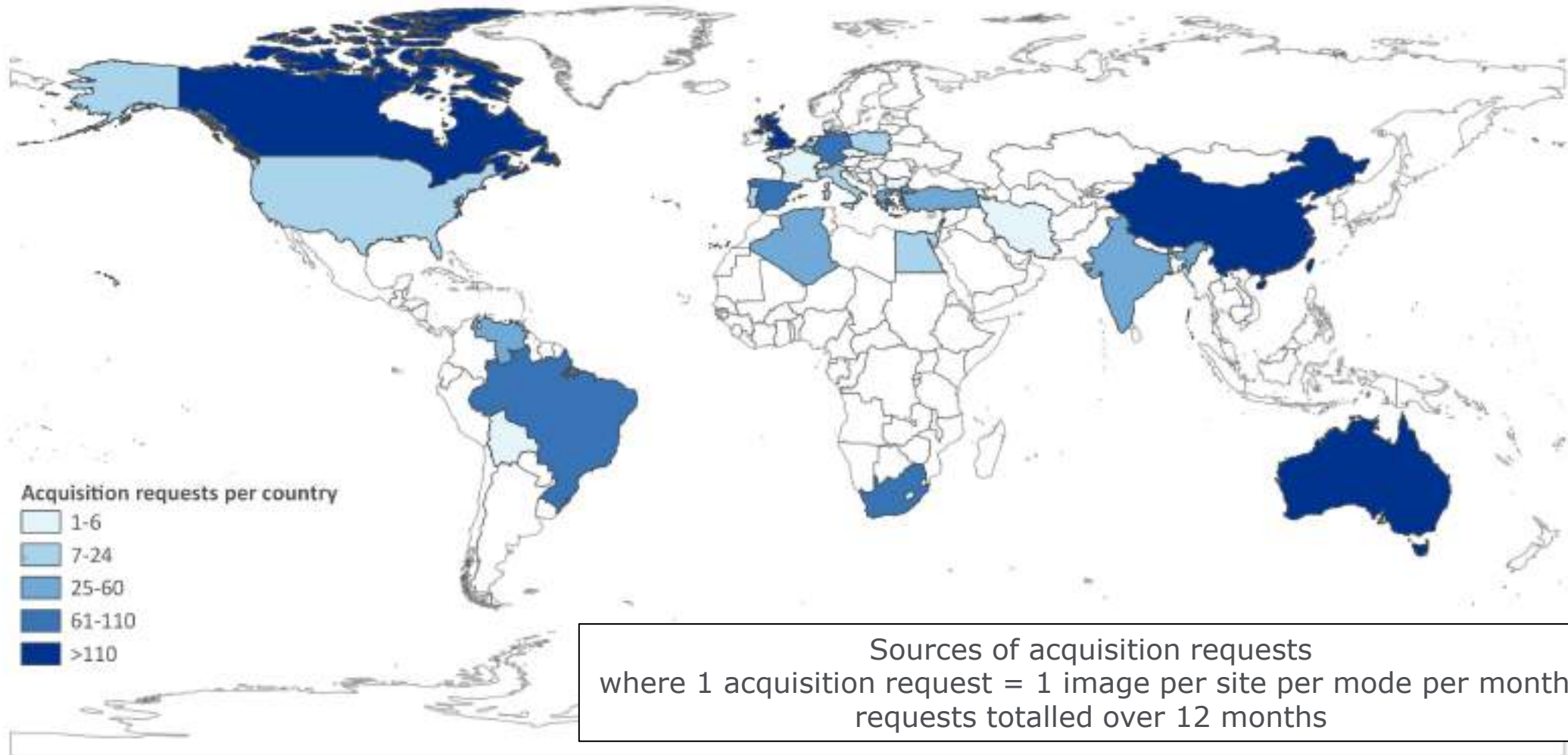
PIs with Active Science Sites 2002-2022



PIs: The CHRIS Community



PIs: The CHRIS Community



- J. Settle
- M. Barnsley
- J. Moreno
- F. Baret
- T. Schneider
- M. Chopping
- R. Mitchell
- K. Ruddick
- S. Lavender
- G. de Leeuw
- S. Silvestri
- I. Grant
- N. Sifakis
- S. Liang
- F. Kayitakire
- T. Milton
- D. Goodenough
- Sugianto
- R. Cleverley
- N. Floury
- V. Demarez
- J. Miller
- P. Gege
- E. Ben-Dor
- S. Mannheim
- M. Wiegner
- K. Staenz
- D. Nys
- V. Siinghroy
- I. Pippi
- H. Bach
- F. De Troch
- B. Blair
- P. Lewis
- T. Cudahy
- R. Merton

Original Sites in 2002

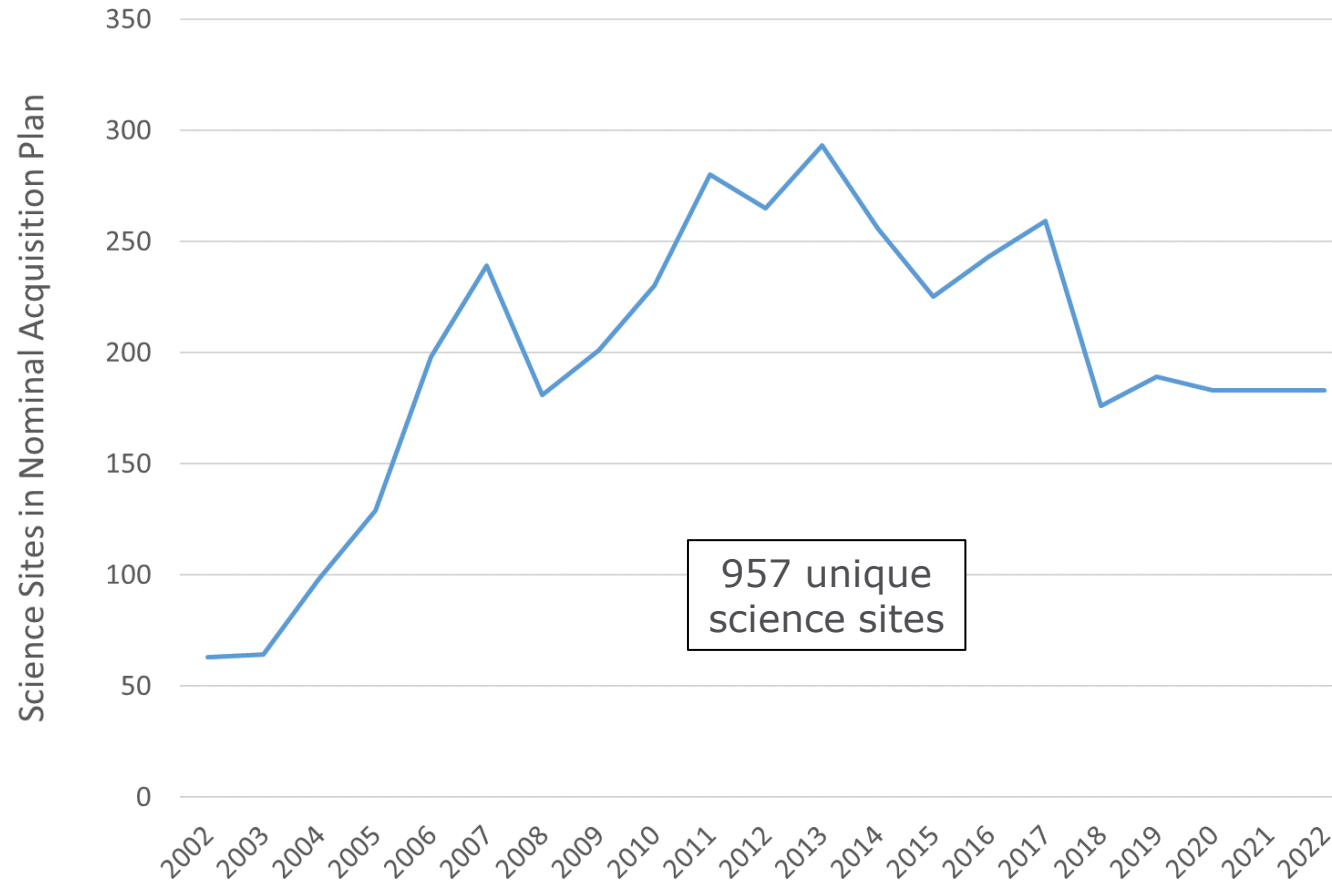


First CHRIS Image

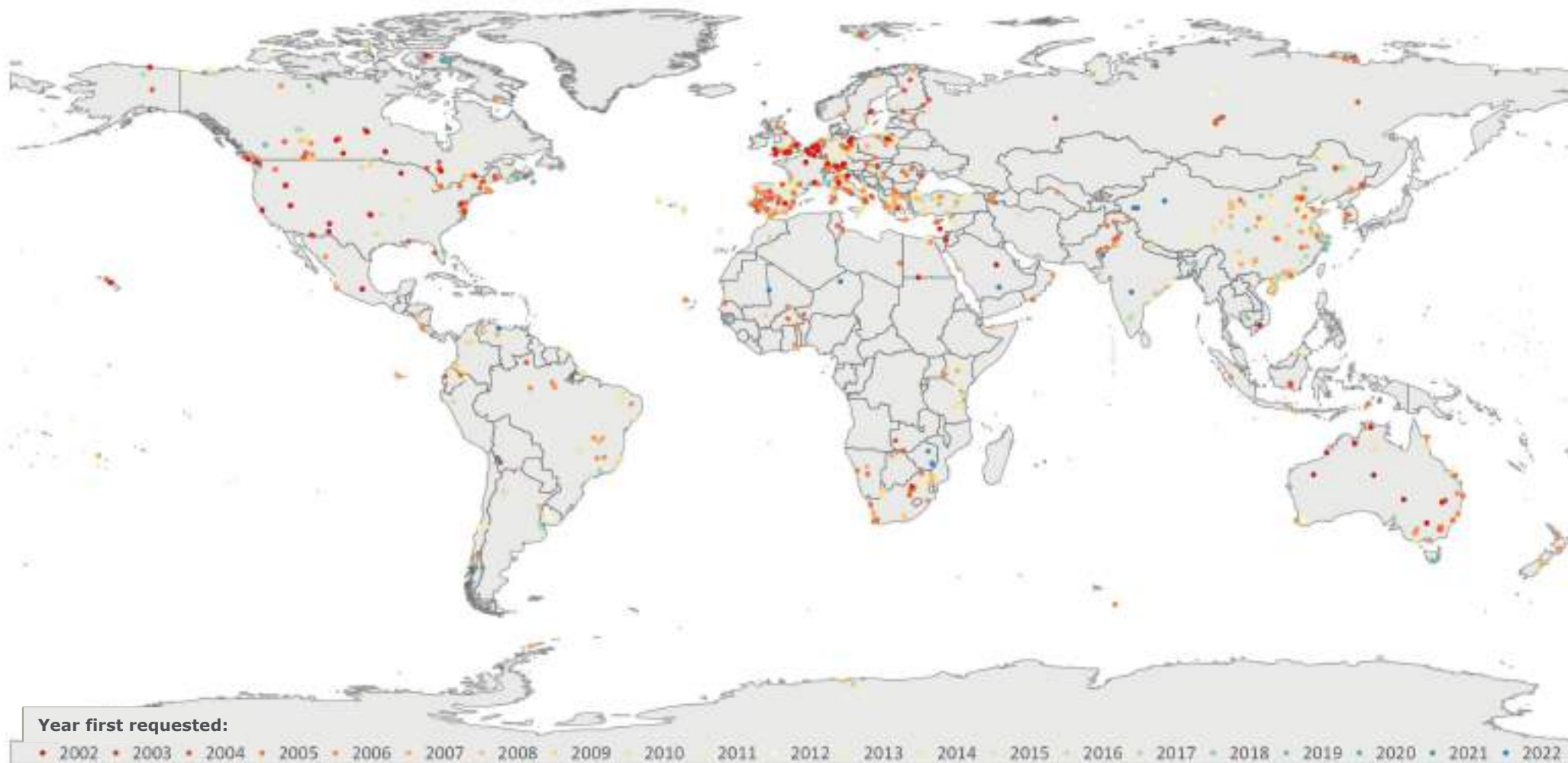
On 14 May 2002, the CHRIS instrument imaged the Valle Fossa di Porto area, near **Venice**, Italy. This was the first image acquired after the commissioning phase.



Active Science Sites 2002-2022



All 957 Science Sites

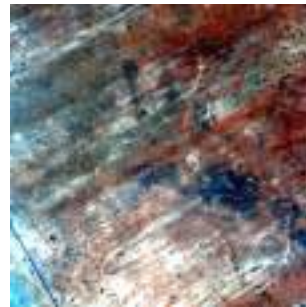


**Longest Standing Science Site:
Barrax, Spain**



Most Imaged Science Sites

Jornada	111
Chamela	83
Albufera	70
Manly-Beach	67
DonanaN	65
Marsabit	60
Lake-Argyle	60
Mata-Seca	59
Sturt-Plains	56
NASA-Howland	55
DonanaS	53
Paraiba	52
Frascati	50



*Jornada
7 August 2003*



*Jornada
21 December 2022*



*Chamela
16 June 2006*



*Chamela
9 September 2022*

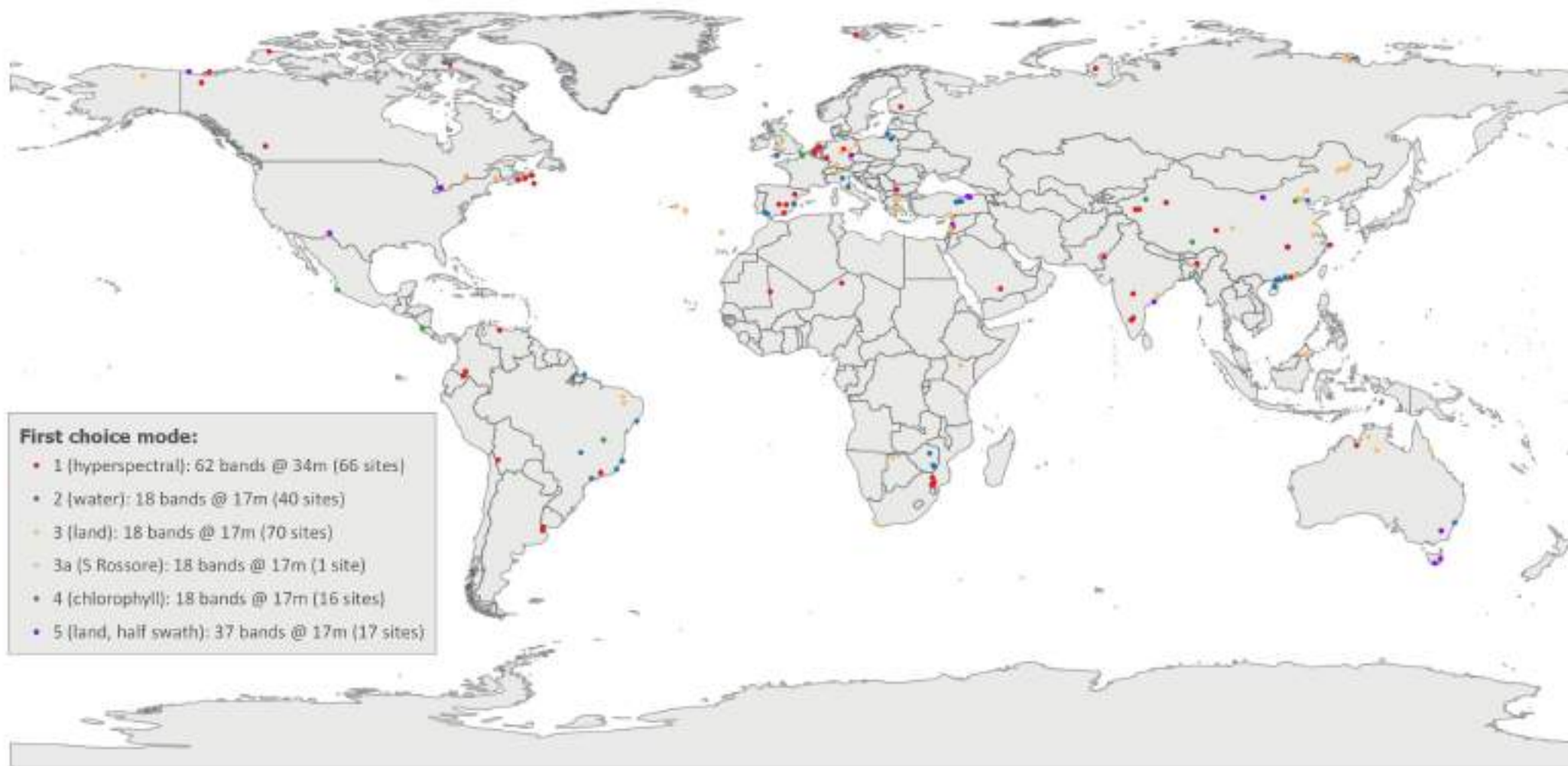


*Albufera
14 August 2006*

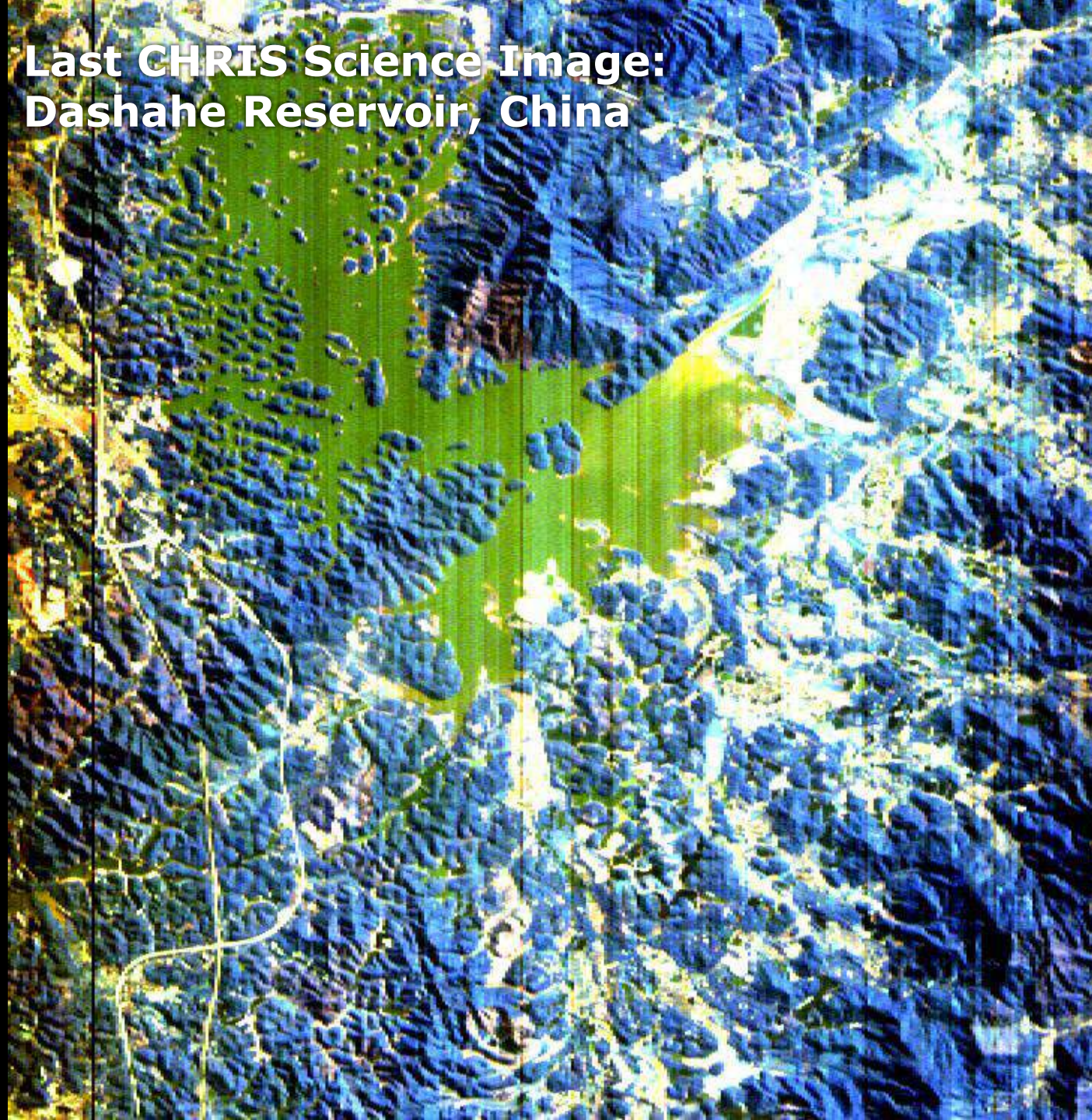


*Albufera
19 July 2022*

Science Sites in Final Nominal Acquisition Plan 2022



**Last CHRIS Science Image:
Dashuhe Reservoir, China**



22 December 2022

10 Calibration Sites



10 Calibration Sites



Ivanpah Playa



Frenchman Flat



La Crau



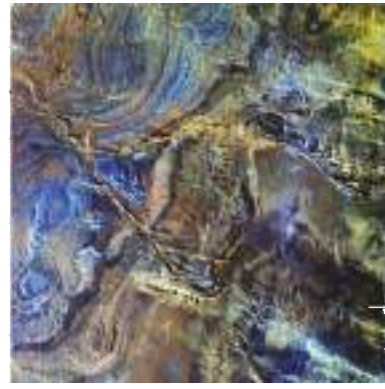
Tuz Golu



Baotou Sandy



Railroad Valley Playa



Gobabeb



Negev



Dunhuang



DOME-C

56 Showcase Sites



56 Showcase Sites



Mount St Helens



Soufrière Hills (Montserrat)



Rome

Summary



- During **21** years of CHRIS operations
- **8,473** cloud-free science image sets acquired
- serving **279** different PIs
- studying **957** science sites



La Plata



Chivero



London



Herschel Island



Mingshui County



Thank you

*CHRIS acquisition over
Ghent, 6 October 2007*

